

ABSTRACT OF THE DISCLOSURE

Cost-effective, simple, low-noise, crossed-field devices such as a microwave magnetron, a microwave oven utilizing same, and crossed-field amplifier utilize an azimuthally varying, axial magnetic field. The magnetic configuration
5 reduces and eliminates microwave and radio frequency noise. This microwave noise is present near the carrier frequency and as sidebands, far separated from the carrier. The device utilizes azimuthally-varying, axial, magnetic field perturbations. At least one permanent perturbing magnet having an azimuthally-varying magnetic field impressed thereupon causes the axial magnetic field to vary azimuthally in the
10 magnetron and completely eliminates the microwave noise and unwanted frequencies. Preferably, the number of axial magnetic field perturbations is based on the number of cavities of the magnetron.